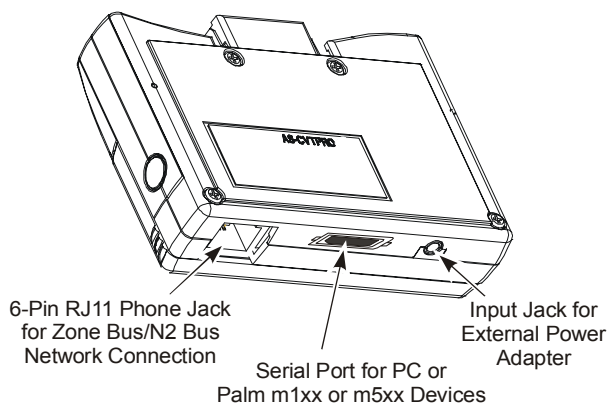# AS-CVTPROx00-1 Zone Bus/N2 Bus Interface Converter

Application

The AS-CVTPROx00-1 Zone Bus/N2 Interface Converter is portable converter designed to provide a communication interface between the room sensors and controllers operating on a Zone Bus or N2 Bus and a Personal Computer (PC) or specified models of the Palm™ family of Personal Digital Assistants (PDAs). See Table 2 for compatible Palm devices. See Table 4 for compatible tools, Operating Systems (OSs) and controllers.

Note: The AS-CVTPROx00-1 converter can be used in place of the MM-CVT101-0 converter module. The MM-CVT101-0 converter is not compatible with Windows NT®, Windows® 2000 and later versions of Windows OSs.
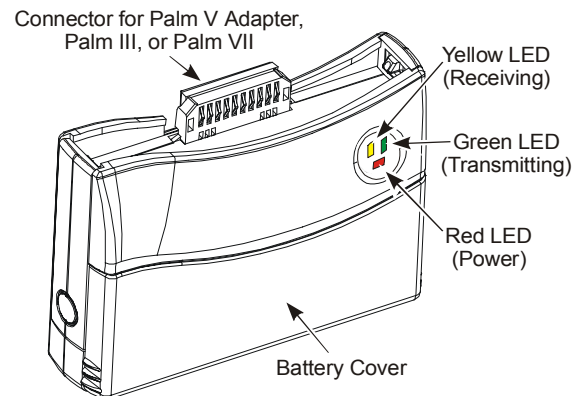
Connection Ports

The back of the CVTPRO converter (Figure 1) has ports for connections to a Personal Computer (PC), a Palm handheld PDA, an External Power Adapter, and a Zone Bus/N2 Bus RJ11 6-pin network cable phone plug.

6-Pin RJ11 Phone Jack for Zone Bus/N2 Bus Network Connection

Serial Port for PC or Palm m1xx or m5xx Devices

Input Jack for External Power Adapter

Figure 1: CVTPRO Converter Back

The front of the CVTPRO converter (Figure 2) shows the mating connector for a Palm III, Palm V, or Palm VII PDA. Green and yellow Light-Emitting Diodes (LEDs) display the N2 communication status of the unit relative to the field device. The red LED shows power status.

Connector for Palm V Adapter, Palm III, or Palm VII

Yellow LED (Receiving)

Green LED (Transmitting)

Red LED (Power)

Battery Cover

Figure 2: CVTPRO Converter Front

⚠ CAUTION: Risk of Property Damage
Do not apply power to the system before checking all wiring connections. Short circuited or improperly connected wires may result in permanent damage to the equipment.

Cable Connectors

Figure 3 shows the 6-pin phone plug end of the N2 cable used by the CVTPRO converter for N2 Bus communication. For Zone Bus communication, always use standard Zone Bus cables.

N2+ (Blue)

N2 Ref. (Red)

N2- (White)
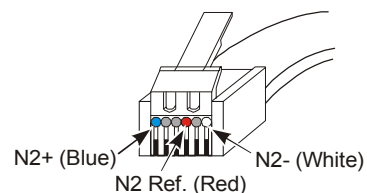
Figure 3: N2 Cable 6-Pin RJ11 Network Phone Plug

Pin	Signal
1	N2+
2	Zone Bus Power
3	GND
4	N2 Ref
5	Zone Bus Signal
6	N2-

Figure 4: Zone Bus/N2 Bus RJ11 Network Phone-Jack Pin Designations

Table 1: Cables Included with the CVTPRO Converter

To Connect the CVTPRO Converter To:	Use This Cable:
PC via RS232	CVTPRO serial cable (18 inches/457 mm)
Controller via the Zone Bus	8-pin RJ45 to 6-pin RJ11 phone cable (6 ft/1.8 m)
Controller via the N2 Bus	4-pin N2 socket/3-pin N2 plug to 6-pin RJ11 phone cable (6 ft/1.8 m) Note: Remove the 4-pin N2 socket from the cable and use the bare wires to connect to N2 screw terminal devices.
Controller Zone Bus (via TE-6x00/ TMZ sensor)	6-pin to 6-pin RJ11 phone cable (6 ft/1.8 m)

Table 2: Connections to Palm Devices

To Connect the CVTPRO Converter To:	Use:	In This Sequence
Palm III and Palm VII Devices	Nothing	Palm III/Palm VII ⇒ CVTPRO converter
Palm V Device	Dock V Pro™ Adapter[1]	Palm V ⇒ Dock V Pro Adapter ⇒ CVTPRO converter
Palm m100 and m105 Devices	Palm HotSync® Cable[2] Null Modem Adapter[2] CVTPRO Serial Cable[3]	Palm m100/m105 ⇒ Palm HotSync Cable ⇒ null modem adapter ⇒ CVTPRO Serial Cable ⇒ CVTPRO converter
Palm m125, m130, and m5xx Devices	Belkin® Serial Sync Cable[2] Null Modem Adapter[2] CVTPRO Serial Cable[3]	Palm m125/m130/m5xx ⇒ Belkin Serial Sync Cable ⇒ null modem adapter ⇒ CVTPRO Serial Cable ⇒ CVTPRO converter

1   The Dock V Pro adapter is available from Solvepoint Corporation at www.palmdock.com and local retailers.

2   Order through Johnson Controls e-Purchasing (ITAS). See Table 3.

3   Included with the CVTPRO converter.

Table 3: CVTPRO Converter and Accessories Product Code Numbers
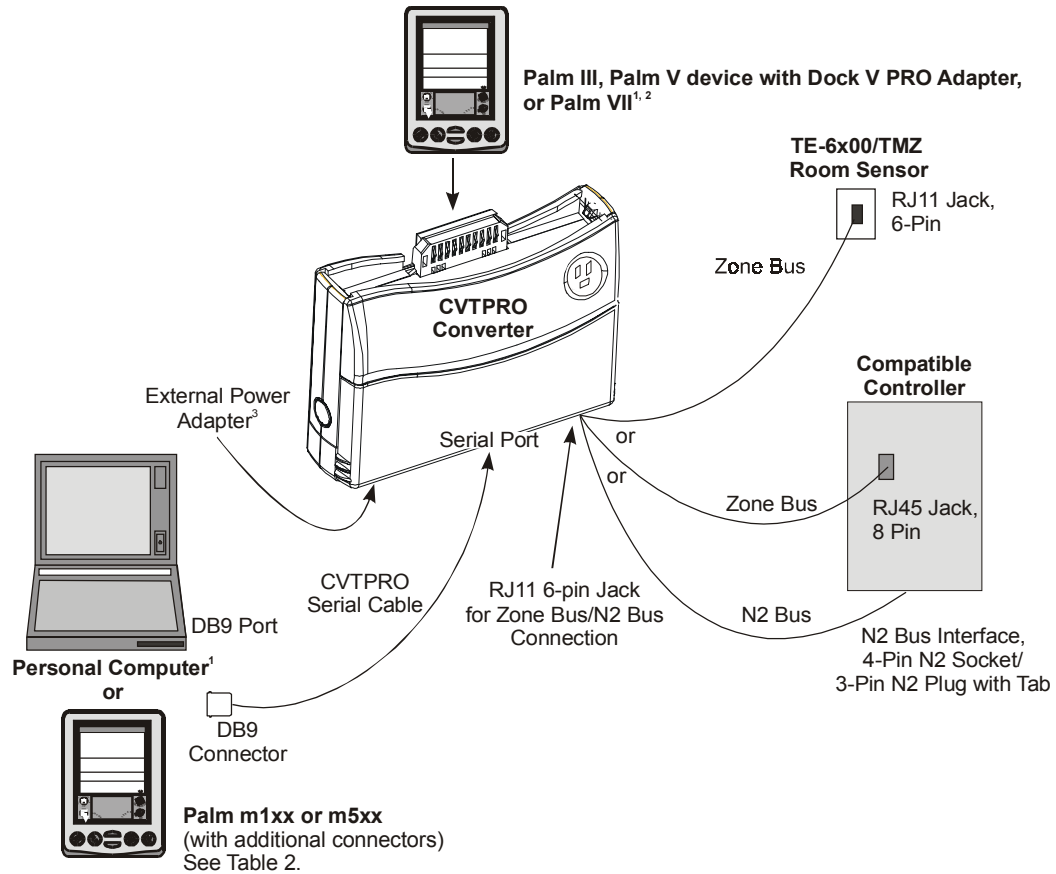
Product Code Number	Description
AS-CVTPRO100-1	Zone Bus/N2 Bus Interface Converter with 120VAC/3VDC power adapter (North American version)
AS-CVTPRO200-1	Zone Bus/N2 Bus Interface Converter without power adapter (European version)
AS-CVTPRO-701	CVTPRO converter without cables or case
AS-CVTCBL-700	Replacement set of cables used with the CVTPRO converter
Dock V Pro adapter**	Adapter to connect the CVTPRO converter to a Palm V device
F3X1082-03*	Belkin Serial Sync Cable for use with CVTPRO converter and Palm m125/m130/m5xx Devices
ME213*	Black Box™ Null Modem Adapter for use with CVTPRO and Palm m100/m105/m125/m130/m5xx Devices
P10701U*	Palm HotSync Cable for use with CVTPRO converter and Palm m100/m105 Devices

*   These are the manufacturer's code numbers, not Johnson Controls code numbers. Order through Johnson Controls e-Purchasing (ITAS).

**   The Dock V Pro adapter is available from Solvepoint Corporation at www.palmdock.com and local retailers.

Connecting to the CVTPRO Converter

Figure 5 illustrates the potential connections between a CVTPRO converter and other devices. Refer to Table 1 and Table 2 for more information on cables and Palm devices. See Figure 6 and Figure 7 for more detail about N2 Bus connections.

Palm III, Palm V device with Dock V PRO Adapter, or Palm VII[1,2]

TE-6x00/TMZ
Room Sensor

RJ11 Jack,
6-Pin

Zone Bus

CVTPRO
Converter

Compatible
Controller

External Power
Adapter[3]

Serial Port

or

or

Zone Bus

RJ45 Jack,
8 Pin

DB9 Port

CVTPRO
Serial Cable

RJ11 6-pin Jack
for Zone Bus/N2 Bus
Connection

N2 Bus

N2 Bus Interface,
4-Pin N2 Socket/
3-Pin N2 Plug with Tab

Personal Computer[1]
or

DB9
Connector

Palm m1xx or m5xx
(with additional connectors)
See Table 2.

Notes:
1. Do not connect the CVTPRO converter to the Palm device and laptop/PC at the same time.
2. Unplug the Palm device from the CVTPRO converter when not in use (conserves battery power).
3. The CVTPRO200-1 (European version) does not ship with an external power adapter.

Figure 5: Overview of Possible CVTPRO Converter Connections

Connecting the CVTPRO Converter to a Controller with N2 Screw Terminals

To connect the CVTPRO converter to a controller with screw terminals (Figure 6):

1. Disconnect the three N2 wires from the controller screw terminals and temporarily isolate the individual bare wires with insulating tape.

2. Remove the 4-pin N2 socket from the CVTPRO N2 cable to expose the three wires (Figure 6 and Figure 7).

3. Connect the exposed N2+ (blue), N2- (white), and Ref (red) wires from the CVTPRO N2 cable to the controller screw terminals. Observe proper polarity.

4. Connect the 6-pin RJ11 phone plug on the opposite end of the CVTPRO N2 cable to the CVTPRO converter (Figure 3 and Figure 5).
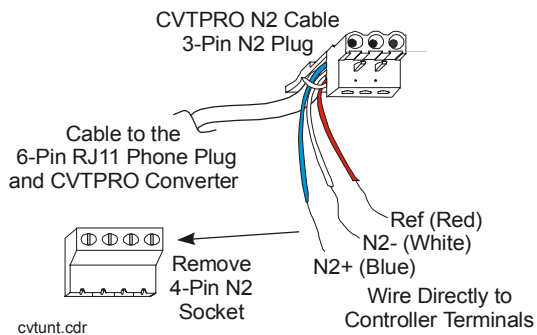
Figure 6: CVTPRO N2 Connection to Controllers with Screw Terminals

Connecting the CVTPRO Converter to a Controller with a N2 Jack
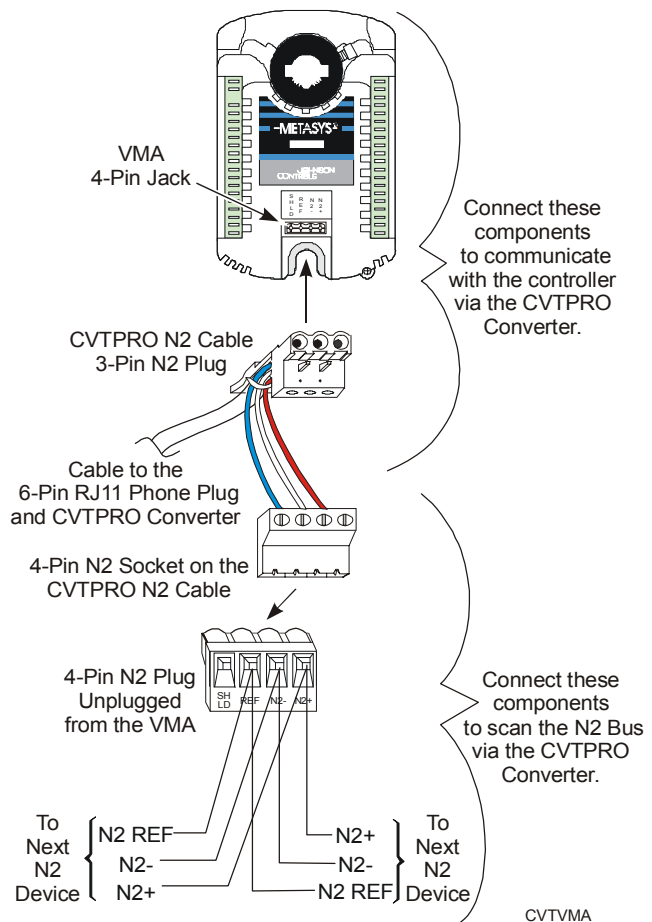
To connect the CVTPRO converter to a controller with a removable N2 plug:

1. Remove the 3 or 4-pin N2 plug from the controller.

2. Plug the 3-pin plug CVTPRO N2 cable into the jack on the controller (The Variable Air Volume Modular Assembly [VMA] has 4-pin jack, and other N2 controllers have 3-pin jacks). Observe proper polarity (N2+ is blue, N2- is white, Ref is red).

3. Connect the 6-pin RJ11 phone plug on the opposite end of the CVTPRO N2 cable to the CVTPRO converter (Figure 3).

Note: Figure 7 shows the possible connections with a VMA controller with a removable 4-pin N2 plug.

To scan a N2 Bus:

1. Disconnect the N2 Bus from the N2 master controller.

2. Remove the N2 plug (with attached N2 wires) from the controller (4-pin plug on the VMA and 3-pin plug on other controllers).

3. Connect the 3-pin or 4-pin N2 plug that was disconnected from the controller in Step 2, to the 4-pin N2 socket on the CVTPRO converter cable. (See Figure 7.) Observe proper polarity (N2+ is blue, N2- is white, Ref is red).

4. Connect the 6-pin RJ11 phone plug on the opposite end of the CVTPRO N2 cable to the CVTPRO converter (Figure 3 and Figure 5).

Figure 7: CVTPRO N2 Connection to a VMA with a Removable N2 Plug

Compatibility

Table 4 lists compatible tools, Operating Systems, and controllers used over the Zone Bus and N2 Bus with the CVTPRO converter.

Compatible controllers include the Air Handling Unit (AHU), Unitary Controller (UNT), Variable Air Volume Controller (VAV), Network Dialer Module (NDM), and VMA.

Table 4: Compatibility Chart

Tool	Bus	Operating System	Compatible Controller
HVAC PRO Software (part of M-Tool Release 5.0 or later)	N2 Bus	Windows 98 SE/Windows NT[1]/ Windows 2000PE[2] OS	AHU1xx
	Zone Bus	Windows 98 SE/Windows 2000PE[2, 3] OS	UNT1xx UNT11xx VAV1xx VMA14x0
	Zone Bus	Windows NT[1]	VMA14x0*
VBT1400	Zone Bus	Palm Personal Digital Assistant (PDA) with OS Version 3.5 or later	VMA14x0
VBT1200	Zone Bus	Palm PDA with OS Version 2.x or later	VMA12x0
GX-9100 Software Configuration Tool (part of M-Tool Release 5.0 or later)	N2 Bus	Windows 98 SE/Windows NT[1]/ Windows 2000PE[2] OS	DT-9100 DX-9100 XT9100 (XP91xx) XTM-905 (XPx-xxx)
XTM Configuration Tool	N2 Bus	Windows 98 SE/[1]Windows NT[1]/ Windows 2000PE[2] OS	XTM-105 (XPx-xxx)
NDM Configuration Tool	N2 Bus	Windows 98 SE/ Windows NT[1]/ Windows 2000PE[2] OS	NDM

Note: The CVTPRO converter is not compatible with Zone Terminal Units (ZTUs). For ZTUs, use the CBLPRO-2 converter. See the *Auxiliary Gear Technical Bulletin (LIT-6363080)* for details on Johnson Controls® converters.

1   For proper CVTPRO converter operation when running on Windows NT OSs, Service Pack 6 must be installed.

2   For proper CVTPRO converter operation when running on Windows 2000 OSs, use the Professional Edition only, and Service Pack 2 must be installed.

3   On Zone Bus applications running on Windows 2000 OSs, HVAC PRO Version 8.04B or later must also be installed.

*   When using the VMA14x0 with HVAC PRO software (versions prior to Version 8.04B only) over the Zone Bus with Windows NT OSs, a Device Conflict box appears whenever the user attempts an operation (for example, upload or download). To bypass the box, select Yes or No and the box disappears. The selected operation continues as expected.

Battery Power Recommendations

The CVTPRO converter requires two (user-supplied) AAA alkaline type batteries on N2 Bus applications (when the External Power Adapter is not used). Battery life varies depending on the N2 Bus load, ambient temperature and type of batteries. See Table 5 and observe the following guidelines.

- Always have a spare set of new batteries on hand.

- When performing long downloads with the CVTPRO converter, use the External Power Adapter instead of batteries.

Table 5: *Typical Battery Life in CVTPRO Converter

AAA Battery: Manufacturer and Model/Type	Battery Life
Ray-O-Vac® Industrial Plus	4-1/2 hours
Duracell® CopperTop	5-1/2 hours
Eveready® Energizer Max®	6-1/2 hours

*   using a CVTPRO converter in continuous operation on a fully loaded N2 Bus at room temperature (70°F [21°C])

Technical Specifications

Product	AS-CVTPROx00-1 Zone Bus/N2 Bus Interface Converter
	AS-CVTPRO100-1 with 120VAC/3VDC External Power Adapter (North American version)
	AS-CVTPRO200-1 without power adapter (European version)
Power Requirements	**Zone Bus:** Controller Supplied Power: Stand-alone or via Thermostat - 24 VAC or VMA applications - 15 VDC
	N2 Bus: External Power Adapter: 120 VAC to +3 VDC 200 mA Class 2 Transformer (Included with CVTPRO Converter in North America only) or Battery Power: Two type AAA Alkaline, not included, see Table 5.
Agency Listings	FCC Part 15 Subpart B, Class A
	CE Mark: EN50081-2 (Electromagnetic Compatibility, EN55011, Class A) EN50082-2 (Electromagnetic Compatibility, EN61000-3-2 and EN61000-3-3)
Ambient Operating Conditions	0 to 50°C (32 to 122°F) 20-80% RH (Relative Humidity)
	30°C (86°F) Maximum Dew Point
Ambient Storage Conditions	-40 to +60°C (-40 to 140°F) 5-95% RH
	30°C (86°F) Maximum Dew Point
Shipping Weight	0.227 kg (0.5 lb.)

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

Refer to the *Auxiliary Gear Technical Bulletin (LIT-6363080)* for necessary information on ordering, operation, and performance specifications of this product.